

New 8 GeV Beam Line Technical Systems

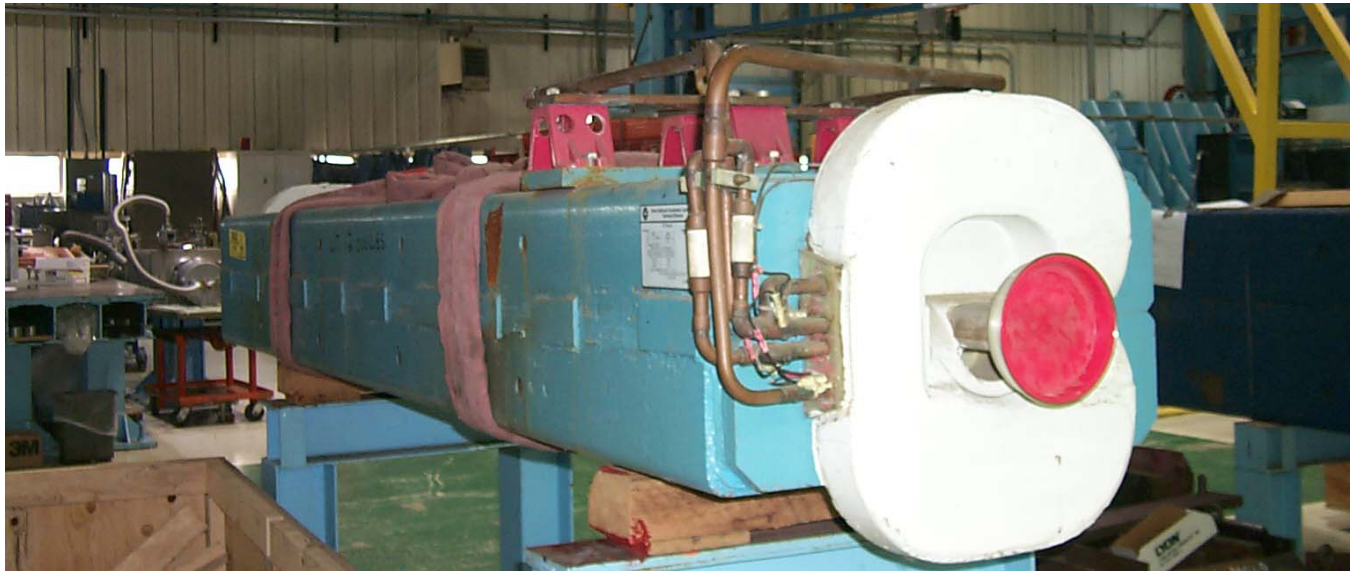
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Proton Driver Meeting
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Toy WBS

1. Magnets
2. Vacuum
3. Power supplies
4. Injection
5. Collimation
6. 8 GeV Dump
7. Debuncher
8. Instrumentation
9. Controls
10. Safety system
11. Utilities
12. Installation

1.1. Magnets – arc dipoles

- Refurbish Main Ring B2 (65 each)
- 6.071 m long, aperture 99 mm x 48 mm
- 125 A for 0.05 T
- 100 W/magnet, no water

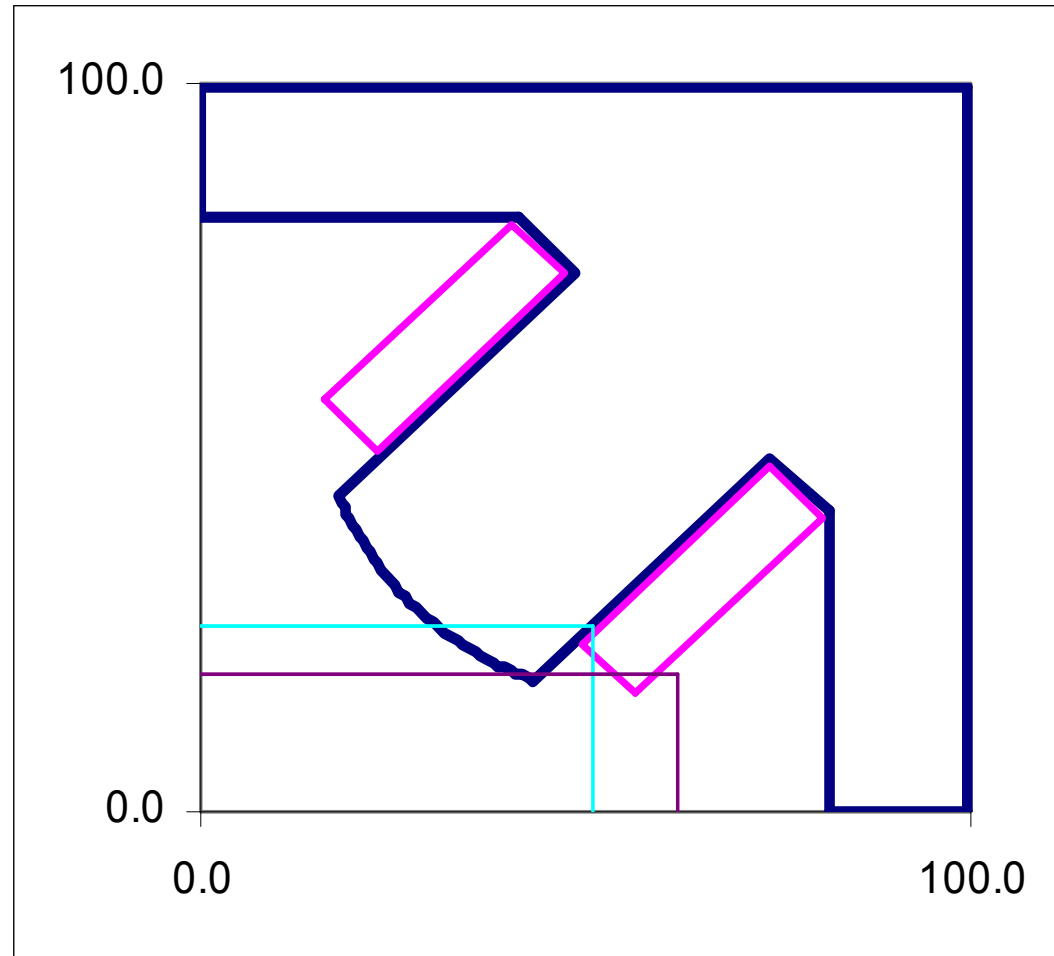


1.2. Magnets – C Magnets

- First half cell of first arc
- Allows
 - Arc-off running to high power dump
 - Under-accelerated beam out to “dump”
- New design (3 each)
- Same performance specs as B2

1.3. Magnets - quadrupoles

- New design (47 ea)
 - 1.308 m long (same as short MR quads)
 - 79 mm pole tip diameter
 - 41 A for 1.06 T/m \Rightarrow 390 W/magnet, no water



1.4. Magnets - Trim dipoles

- Main injector trim dipoles (47 each)
- 0.018 T-m at under 6A



2. Vacuum

- Design for 1×10^{-7} torr
- Stainless tube
 - Rectangular in dipoles, 99 mm x 48 mm
 - Round in straights, 144 mm (negotiable)
- Pumps
 - One pump per dipole in arcs
 - One pump per quad in straights
 - Extra pumps at special locations
- Flange connections
- Beam valves, 15-20

Vacuum plus

- Collimators in dipoles to dump stripped ions inside magnets
- Add liner at LN_2 temp to reduce stripping??

3. Power supplies

- Dipoles
 - One supply
 - 125 A, 75 V (negotiable)
- Arc Quads
 - One supply
 - 41 A, 650 V (negotiable)
- Matching quads
 - Six supplies or trims
 - Comparable currents
- Trim dipoles
 - 47 individual supplies
 - 6 A, 30 V (negotiable)
- Cables, busses

4. Injection

- Injection painting into Main Injector will be interesting
- Includes dump

5. Collimation

- Foils
- Dumps

6. 8 GeV Dump

- 2 MW dump at end of linac to take full beam power
- Modeled on Main Injector dump
- Included elsewhere
 - Dumps for collimation system
 - Dump for unstripped beam on injection

7. Debuncher

- Nothing to report

8. Instrumentation

- BPM system – at quads
- Beam loss monitors - everywhere
- Torroids – start, middle, end
- Profile monitors – start, middle, end, arcs
- Longitudinal profile monitor(s)
- Cables

9. Controls

- Yes
- Standard
- Cables

10. Safety system

- **Yes!**
- Standard

11. Utilities

- LCW
 - Needed for power supplies
 - Needed for dumps

12. Installation

- Stands
 - Magnets
 - Vacuum
 - Instrumentation
- Placement
- Alignment
- Coordination